

**Los Alamos**  
NATIONAL LABORATORY

Los Alamos National Laboratory  
Los Alamos, New Mexico 87545



Date: January 22, 1999  
In Reply Refer To: ESH-18/WQ&H:99-0016  
Mail Stop: K497  
Telephone: (505) 665-2014

Ms. Barbara Hoditschek  
Surface Water Quality Bureau  
New Mexico Environment Department  
P.O. Box 26110  
Santa Fe, New Mexico 87502

**SUBJECT: NOTICE OF INTENT TO DISCHARGE POTABLE WATER, TA-53-364  
ENCLOSED TANK, ASTRONOMICAL PROJECT**

Dear Ms. Hoditschek:

Please find enclosed an Administrative Record for Potable Water Releases per your request. This Administrative Record is being submitted by Los Alamos National Laboratory in order to establish pre-authorization for the discharge of approximately 68,000 gallons of potable water. This discharge will be from an enclosed steel tank that was used for experiments and astronomical observations of cosmic rays. The discharge is into the same drainage that was used for the TA-53 "MILAGRO project pools" discharge that took place in June of 1998. On December 4, 1998, samples were collected for a suite of analytes which included; Gross alpha/beta, gamma, oil & grease, total and free chlorine and pH. Metals were not submitted for analysis as this is a closed system and metals contamination is not expected to be present. Discharge of this water is expected to take several days at a rate of approximately 20,000 gallons per day (8 hr day) or 41 gallons per minute. The sample data from the tank, 1997 SDWA sample data and two maps of the discharge area are also included with this package.

Please contact me at 665-2014 if you have additional questions or concerns.

Sincerely,

Harvey Decker  
Water Quality and Hydrology Group



4505

HSWA LANL 2/1100/53

TK

Ms. Barbara Hoditschek  
ESH-18/WQ&H:99-0016

- 2 -

January 22, 1999

HD/md

Enclosures: a/s

Cy: Phyllis Bustamante, NMED/GWPB, Santa Fe, NM, w/enc.  
John Kieling, NMED/HRMB, Santa Fe, NM, w/enc.  
Steven Rae, ESH-18, w/o enc., MS K497  
Mike Saladen, ESH-18, w/o enc., MS K497  
James Fraser, LANSCE FM, w/enc., MS H814  
Camilio Espinoza, P-25, w/enc., MS H 846  
WQ&H File, w/enc., MS K497  
CIC-10, w/enc., MS A150

Los Alamos National Laboratory  
Administrative Record for Potable Water Releases

Responsible Facility/User Group: FMU-P-25 Contact Person: Camilo Espinosa

Phone: 667-9981

Pager: NA

Discharge Location: Discharge has not yet taken place from TA-53-364 Tank.

Corrective Action(s): This discharge will be performed slowly (approximately 20,000 gallons per 8 hr. day) and monitored by site and ESH-18 staff. If erosional damage begins to occur the discharge will be stopped and BMP's will be implemented to prevent any further impact when the discharge is resumed.

Nearest Watercourse and/or Canyon Affected: This discharge will be to a small, asphalt lined ditch which enters a storm drain that empties to a tributary of Sandia Canyon. This is the same drainage location used to empty the TA-53 Milagro Project "pools" in June 1998.

Source and Cause of Discharge: This discharge is expected to be a one time event in order to drain the tank in preparation for disassembly for salvage.

Material to be Discharged: Potable Water

Estimated amount of water to be discharged: 68,000 gallons over a period of several days.

Notification:

NMED: B. Hoditschek

DOE: B. Koch

TIME:

TIME:

DATE:

DATE:

Comments: An inspection of the site was conducted on 11-24-98. This discharge will be from a fully enclosed tank that has been filled with water from the Los Alamos drinking water supply system. This water filled tank was used in the study of cosmic rays and no additives or other contaminants have been introduced into the tank. The tank capacity is approximately 68,000 gallons. Samples of this water were collected on 12/04/98 for gross alpha/beta and gamma, oil & grease, total and free Chlorine and pH analysis. The Chlorine and pH analysis were done in the field at the time of sample collection.

Free and Total Chlorine analysis yielded a result of 0.0 PPM for both parameters and the pH was measured at 8.05 s.u. at 21.9°C. All other parameters analyzed were non-detect except for gross alpha which had a value of 2.44 pCi/L reported. This value for gross alpha is consistent with samples collected from the potable water supply wells located on the Pajarito Mesa. The sample analysis is attached with this report. The requested analytical data on the supply wells can be found on the enclosed copies of the SDWA section from the Environmental Surveillance at Los Alamos, report for 1997 (latest report).



# ASSAIGAI ANALYTICAL LABORATORIES, INC.

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3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820  
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**LOS ALAMOS NATIONAL LABS**  
attn: **HARVEY DECKER**  
**MAIL STOP K497**  
**LOS ALAMOS, NM 87545**

### \* explanation of codes

B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

## Certificate of Analysis

Client: **LOS ALAMOS NATIONAL LABS**  
Project: **9812065 POT.WTR.TK.8K25E-250LND10000**

*William P. Biava*  
William P. Biava, President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: **53-364, 60K TANK** Sample Matrix: **AQ** Sample Collected: **12/04/98 13:55:00**

Fraction	QC Group	CAS #	Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date	
<b>Test: EPA 900</b>										
9812065-01A	ARS981195		Gross Alpha	2.44+/-0.51	pCi/L	1	1.02	S	MT.1998.3419-1	12/31/98
	ARS981195		Gross Beta	ND	pCi/L	1	2.11	S	MT.1998.3419-1	
<b>Test: EPA 901.1M</b>										
9812065-01A	MT.1998.3420		Americium-241	ND	pCi/L	1	1.13	S	MT.1998.3420-1	12/30/98
	MT.1998.3420		Beryllium-7	ND	pCi/L	1	2.88	S	MT.1998.3420-1	
	MT.1998.3420		Cesium -137	ND	pCi/L	1	0.78	S	MT.1998.3420-1	
	MT.1998.3420		Cesium-134	ND	pCi/L	1	1.22	S	MT.1998.3420-1	
	MT.1998.3420		Cobalt-57	ND	pCi/L	1	0.39	S	MT.1998.3420-1	
	MT.1998.3420		Cobalt-60	ND	pCi/L	1	0.66	S	MT.1998.3420-1	
<b>Test: EPA 1664</b>										
9812065-01B	OG9834		Oil & Grease	ND	mg / L	1	5		MT.1998.3219-8	12/11/98

\*\*\* Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. \*\*\*  
\*\*\* Results relate only to the items tested. \*\*\*



Assaigal Analytical Laboratories, Inc.  
**Quality Control Summary**

Client: **LOS ALAMOS NATIONAL LABS**  
 Project: **9812065 POT.WTR.TK.8K25E-250LND10000**

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type: **LCS: Lab Control Spike**      QC Matrix: **WATER**

QC Group	Run ID	Result	Units	*	Sequence	Run Date
<i>Test: EPA 1664</i>						
OG9834	OG9834( 2)	Oil & Grease	80	% Recovery	MT.1998.3219-2	12/11/98

QC Type: **MB: Method Blank**      QC Matrix: **WATER**

QC Group	Run ID	Result	Units	*	Sequence	Run Date
<i>Test: EPA 1664</i>						
OG9834	OG9834( 1)	Oil & Grease	ND	mg / L	MT.1998.3219-1	12/11/98
	OG9834( 1)	Oil & Grease	ND	mg / L	MT.1998.3287-1	12/18/98
	OG9834( 1)	Oil & Grease	ND	mg / L	MT.1998.3345-1	12/22/98

QC Type: **MS: Matrix Spike**      QC Matrix: **WATER**

QC Group	Run ID	Result	Units	*	Sequence	Run Date
<i>Test: EPA 1664</i>						
OG9834	OG9834( 4)	Oil & Grease	88	% Recovery	MT.1998.3219-4	12/11/98

QC Type: **MSD: Matrix Spike Duplicate Accuracy**      QC Matrix: **WATER**

QC Group	Run ID	Result	Units	*	Sequence	Run Date
<i>Test: EPA 1664</i>						
OG9834	OG9834( 5)	Oil & Grease	78	% Recovery	MT.1998.3219-5	12/11/98

QC Type: **MSD: Matrix Spike Duplicate Precision**      QC Matrix: **WATER**

QC Group	Run ID	Result	Units	*	Sequence	Run Date
<i>Test: EPA 1664</i>						
OG9834	OG9834( 5)	Oil & Grease	11	RPD	MT.1998.3219-5	12/11/98

## 9. Safe Drinking Water Act

**a. Introduction.** This program includes sampling from various points in the Laboratory, Los Alamos County, and Bandelier National Monument's water distribution systems and from the water supply wellheads to ensure compliance with the Safe Drinking Water Act (SDWA) (40 CFR 141). The DOE provides drinking water to Los Alamos County and Bandelier National Monument. The EPA has established maximum contaminant levels (MCLs) for microbiological organisms, organic and inorganic constituents, and radioactivity in drinking water. These standards have been adopted by the state and are included in the New Mexico Drinking Water Regulations (NMEIB 1995). The NMED has been given authority by EPA to administer and enforce federal drinking water regulations and standards in New Mexico.

The particular locations within the water system where SDWA compliance samples are collected are specified in the regulations for each contaminant or group of contaminants. In 1997, the monitoring network for SDWA compliance sampling consisted of the following 4 location groups within the water system:

- (1) wellhead sampling from the water supply wells in operation at the time of sampling (Guaje wells G-1, G-1A, G-2, G-4, G-5, G-6; Pajarito Mesa wells PM-1, PM-2, PM-3, PM-4, PM-5; and Otowi wells O-4, O-1);
- (2) the 5 entry points into the distribution system (Pajarito Booster station #2, Guaje Booster station #2, PM-1 and PM-3 wellheads, and Otowi Booster station # 2 (formerly Los Alamos Booster station #4);
- (3) the 6 total trihalomethane (TTHM) sampling locations within the distribution system; and

## 2. Compliance Summary

- (4) the 41 microbiological sampling sites located throughout the Laboratory, Los Alamos County, and Bandelier National Monument.

The sampling program for drinking water quality is designed to meet or exceed regulatory requirements under the federal SDWA (see Table A-6) and the New Mexico Environmental Improvement Act. Sampling locations, frequencies, preservation, handling, and analyses follow the requirements specified in federal and state regulations. Chemical and radiological sampling is performed by Laboratory staff and submitted for analysis to the New Mexico Health Department's Scientific Laboratory Division (SLD) in Albuquerque. Dioxin analyses are performed by Triangle Laboratories, Inc., of Durham, NC. Microbiological sampling and analysis are performed by the JCNNM Environmental (JENV) laboratory. The JENV laboratory is certified by NMED for microbiological compliance analysis. Certification requirements include proficiency samples, maintenance of an approved quality assurance/quality control program, and periodic audits by NMED. Laboratory and JENV staff are certified by NMED to perform drinking water compliance sampling.

All data collected from SDWA compliance testing are submitted to the NMED's Drinking Water and Community Services Bureau for review and filing. The SLD and JENV laboratory report their analytical results directly to NMED. ESH-18 maintains both electronic and hard-copy files of all data collected from SDWA compliance testing.

**b. Radiochemical Analytical Results.** As required by the SDWA, in 1997, the Laboratory collected drinking water samples at the five entry points into the distribution system to determine the radiological quality of the drinking water. As shown in Table 2-5, the concentrations of gross alpha and gross beta activity were less than the screening limits. When gross alpha and beta activity measurements are below the screening limits, the Laboratory does not need to perform further isotopic analyses or perform dose calculations under the SDWA program. However, it should be noted that comprehensive monitoring of the water supply wells for radiochemical constituents is conducted annually by ESH-18 (see Table 5-22).

In 1997, the Laboratory conducted baseline sampling on the new Otowi well O-1. Baseline sampling is conducted for four consecutive quarters and is required by the SWDA for all new sources of water in a drinking water supply system. The three quarters of baseline sampling conducted in 1997 at the

Otowi well O-1 were in compliance with the SWDA screening levels for gross alpha and gross beta activities.

Radon is a naturally occurring radionuclide produced during the decay of geological sources of uranium. In 1997, radon sampling was performed at the 13 operating water supply wellheads and the 5 entry points into the distribution system. This sampling was done to collect information before the issuance of final EPA regulations governing radon in drinking water. As shown in Table 2-6, the concentrations ranged from 109 to 647 pCi of radon per liter of water. On July 30, 1997, EPA withdrew the proposed MCL of 300 pCi of radon per liter of water. Congress has directed EPA to propose a new MCL for radon by August 1999 and promulgate a final rule by August 2000.

**c. Nonradiological Analytical Results.** In 1997, TTHM samples were collected during each quarter from six locations in the Laboratory and Los Alamos County water distribution systems. As shown in Table 2-7, the annual average for samples in 1997 was 6.3  $\mu\text{g}$  of TTHM per liter of water, less than the SDWA MCL of 100  $\mu\text{g}$  of TTHM per liter of water.

In 1997, inorganic constituents in drinking water were sampled at the 13 operating water supply wellheads. As shown in Table 2-8, all locations and all inorganic constituents were less than the MCLs.

In 1997, VOC samples were collected at the 13 operating water supply wellheads. No VOCs were detected at any of the sampling locations with the exception of 13.3  $\mu\text{g}$  of chloroform per liter of water at Otowi well O-1 on April 18, 1997. The SWDA MCL for chloroform is 80  $\mu\text{g}$  of chloroform per liter of water. Chloroform is a byproduct of chlorine disinfection. It is believed that the source of chloroform found in the sample was the chlorine used in disinfecting the well in the weeks before sampling. Chloroform was not detected during repeat sampling at Otowi well O-1 conducted on September 8 and November 14, 1997.

In 1997, synthetic organic compound (SOC) samples were collected at the 13 operating water supply wellheads. Baseline sampling at Otowi well O-1 for SOCs was conducted during the last three quarters of 1997. No SOCs were detected at any of the sampling locations.

In 1997, sampling for the presence of lead and copper from residential taps was not required by the SDWA. Sampling for lead and copper will resume in 1999.



## 2. Compliance Summary

Table 2-5. Radioactivity in Drinking Water (pCi/L) during 1997

Sample Location	Gross Alpha			Gross Beta		
	Calibration Std.	Value	(Uncertainty)	Calibration Std.	Value	(Uncertainty)
<b>Wellheads:</b>						
Otowi Well O-1 (2nd Qtr 1997)	<sup>241</sup> Am	2.6	(0.6)	<sup>137</sup> Cs	2.4	(1.0)
	Natural U	2.9	(0.6)	<sup>90</sup> Sr, <sup>90</sup> Y	2.3	(0.9)
Otowi Well O-1 (3rd Qtr 1997)	<sup>241</sup> Am	2.7	(0.7)	<sup>137</sup> Cs	1.3	(0.8)
	Natural U	3.1	(0.8)	<sup>90</sup> Sr, <sup>90</sup> Y	1.3	(0.8)
Otowi Well O-1 (4th Qtr 1997)	<sup>241</sup> Am	2.6	(0.6)	<sup>137</sup> Cs	1.9	(0.8)
	Natural U	2.9	(0.7)	<sup>90</sup> Sr, <sup>90</sup> Y	1.8	(0.8)
<b>Entry Points:</b>						
Pajarito Booster #2	<sup>241</sup> Am	0.2	(0.3)	<sup>137</sup> Cs	3.4	(0.9)
	Natural U	0.2	(0.3)	<sup>90</sup> Sr, <sup>90</sup> Y	3.4	(0.9)
Guaje Booster #2	<sup>241</sup> Am	1.1	(0.5)	<sup>137</sup> Cs	2.9	(0.9)
	Natural U	1.3	(0.6)	<sup>90</sup> Sr, <sup>90</sup> Y	2.8	(0.9)
Pajarito Well PM-1	<sup>241</sup> Am	2.3	(0.6)	<sup>137</sup> Cs	3.6	(0.9)
	Natural U	2.7	(0.6)	<sup>90</sup> Sr, <sup>90</sup> Y	3.4	(0.8)
Pajarito Well PM-3	<sup>241</sup> Am	1.3	(0.5)	<sup>137</sup> Cs	3.6	(0.8)
	Natural U	1.6	(0.6)	<sup>90</sup> Sr, <sup>90</sup> Y	3.4	(0.7)
Otowi Booster #2 (formerly LA Booster #4)	<sup>241</sup> Am	1.0	(0.6)	<sup>137</sup> Cs	5.5	(1.3)
	Natural U	1.2	(0.7)	<sup>90</sup> Sr, <sup>90</sup> Y	5.3	(1.2)
EPA Maximum Contaminant Level		15		none		
EPA Screening Level		5		50		

**d. Microbiological Analyses of Drinking Water.** Each month during 1997, an average of 46 samples was collected from the Laboratory, Los Alamos County, and Bandelier National Monument's water distribution systems to determine the free chlorine residual available for disinfection and the microbiological quality of the drinking water. Of the 552 samples analyzed during 1997, 2 indicated the presence of total coliforms. None of the samples indicated the presence of fecal coliforms. Noncoliform bacteria were present in 29 of the microbiological samples. Noncoliform bacteria are not regulated, but their presence in repeated samples may serve as indicators of stagnation and biofilm growth in water pipes. A summary of the monthly analytical data is presented in Table 2-9.

**e. Long-Term Trends.** The Los Alamos water system has never incurred a violation for a SDWA regulated chemical or radiological contaminant. The water supply wells have, on occasion, exceeded proposed SDWA MCLs for arsenic and radon because of their natural occurrence in the main aquifer. Violations of the SDWA MCL for microbiological constituents occurred in 1993 and 1994. Both of these violations were attributed to localized contamination in the distribution system and not microbiological contamination of the main aquifer.

**f. Drinking Water Inspection.** The District II Field Office of the NMED did not conduct an inspection of the drinking water system during 1997.

## 2. Compliance Summary

**Table 2-6. Radon in Drinking Water (pCi/L) during 1997**

Sample Location	Value	(Uncertainty)
<b>Entry Points:</b>		
Pajarito Booster #2	472	(28)
Guaje Booster #2	194	(17)
Pajarito Well-PM1	263	(18)
Pajarito Well-PM3	338	(22)
Otowi Booster #2	322	(21)
<b>Wellheads:</b>		
Pajarito Well-PM1	263	(18)
Pajarito Well-PM2	647	(36)
Pajarito Well-PM3	338	(22)
Pajarito Well-PM4	490	(29)
Pajarito Well-PM5	452	(27)
Guaje Well-G1A	377	(25)
Guaje Well-G1	398	(25)
Guaje Well-G2	392	(25)
Guaje Well-G4	398	(26)
Guaje Well-G5	338	(23)
Guaje Well-G6	423	(27)
Otowi Well-O4	440	(26)
Otowi Well-O1	109	(10)

**Table 2-7. Total Trihalomethanes in Drinking Water ( $\mu\text{g/L}$ ) during 1997**

Sample Location	1997 Quarters			
	First	Second	Third	Fourth
<b>Distribution Sites:</b>				
Los Alamos Airport	2.9	10.1	17.5	10.0
White Rock Fire Station	<0.5	<0.5	<0.5	<0.5
North Community Fire Station	0.7	5.4	5.7	4.9
S-Site Fire Station	<0.5	5.7	10.7	5.5
Barranca Mesa School	<0.5	2.3	12.5	1.3
TA-39, Bldg. 02	8.9	13.7	15.6	15.1
<b>1997 Average of 6.3 <math>\mu\text{g/L}</math></b>				
EPA Maximum Contaminant Level				100.0
Sample Detection Limit				0.5

Table 2-8. Inorganic Constituents in Drinking Water (mg/L) during 1997

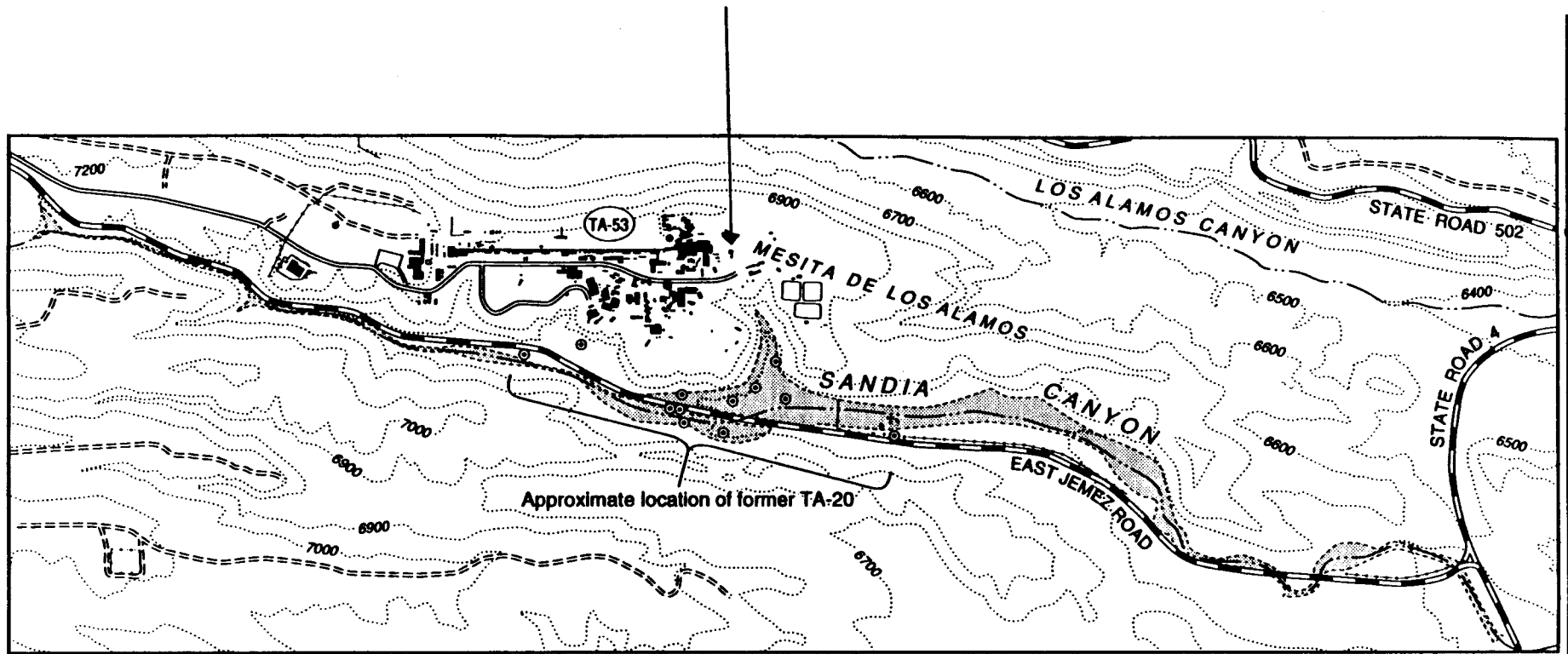
Sample Location	As	Ba	Be	Cd	Cr	F	CN	Hg	Ni	NO <sub>3</sub> (as N)	Se	Sb	Tl
<b>Wellheads:</b>													
Pajarito Well-PM1	0.002	<0.1	<0.001	<0.001	0.003	<0.40	<0.005	<0.0002	<0.01	0.50	<0.005	<0.001	<0.001
Pajarito Well-PM2	0.001	<0.1	<0.001	<0.001	0.003	<0.40	<0.005	<0.0002	<0.01	0.30	<0.005	<0.001	<0.001
Pajarito Well-PM3	0.002	<0.1	<0.001	<0.001	0.003	<0.40	<0.005	<0.0002	<0.01	0.50	<0.005	<0.001	<0.001
Pajarito Well-PM4	0.002	<0.1	<0.001	<0.001	0.005	<0.40	<0.005	<0.0002	<0.01	0.30	<0.005	<0.001	<0.001
Pajarito Well-PM5	0.001	<0.1	<0.001	<0.001	0.005	<0.40	<0.005	<0.0002	<0.01	0.30	<0.005	<0.001	<0.001
Guaje Well-G1A	0.015	<0.1	<0.001	<0.001	0.007	0.70	<0.005	<0.0002	<0.01	0.40	<0.005	<0.001	<0.001
Guaje Well-G1	0.007	<0.1	<0.001	<0.001	0.005	0.40	<0.005	<0.0002	<0.01	0.40	<0.005	<0.001	<0.001
Guaje Well-G2	0.038	<0.1	<0.001	<0.001	0.008	0.80	<0.005	<0.0002	<0.01	0.40	<0.005	<0.001	<0.001
Guaje Well-G4	0.003	<0.1	<0.001	<0.001	0.002	<0.40	<0.005	<0.0002	<0.01	0.60	<0.005	<0.001	<0.001
Guaje Well-G5	0.003	<0.1	<0.001	<0.001	0.002	<0.40	<0.005	<0.0002	<0.01	0.60	<0.005	<0.001	<0.001
Guaje Well-G6	0.003	<0.1	<0.001	<0.001	0.002	<0.40	<0.005	<0.0002	<0.01	0.50	<0.005	<0.001	<0.001
Otowi Well-O4	0.002	<0.1	<0.001	<0.001	0.003	<0.40	<0.005	<0.0002	<0.01	0.30	<0.005	<0.001	<0.001
Otowi Well-O1 (4/97)	0.005	<0.1	<0.001	<0.001	0.010	<0.40	<0.005	<0.0002	<0.01	1.00	<0.005	<0.001	<0.001
Otowi Well-O1 (11/97)										0.44			
EPA Maximum Contaminant Levels	0.05 <sup>a</sup>	2.0	0.004	0.005	0.1	4.0	0.2	0.002	0.1	10.0	0.05	0.006	0.002

<sup>a</sup>Proposed SDWA Primary Drinking Water Standard.

Approximate location of TA-53-364

May 1994

3-28

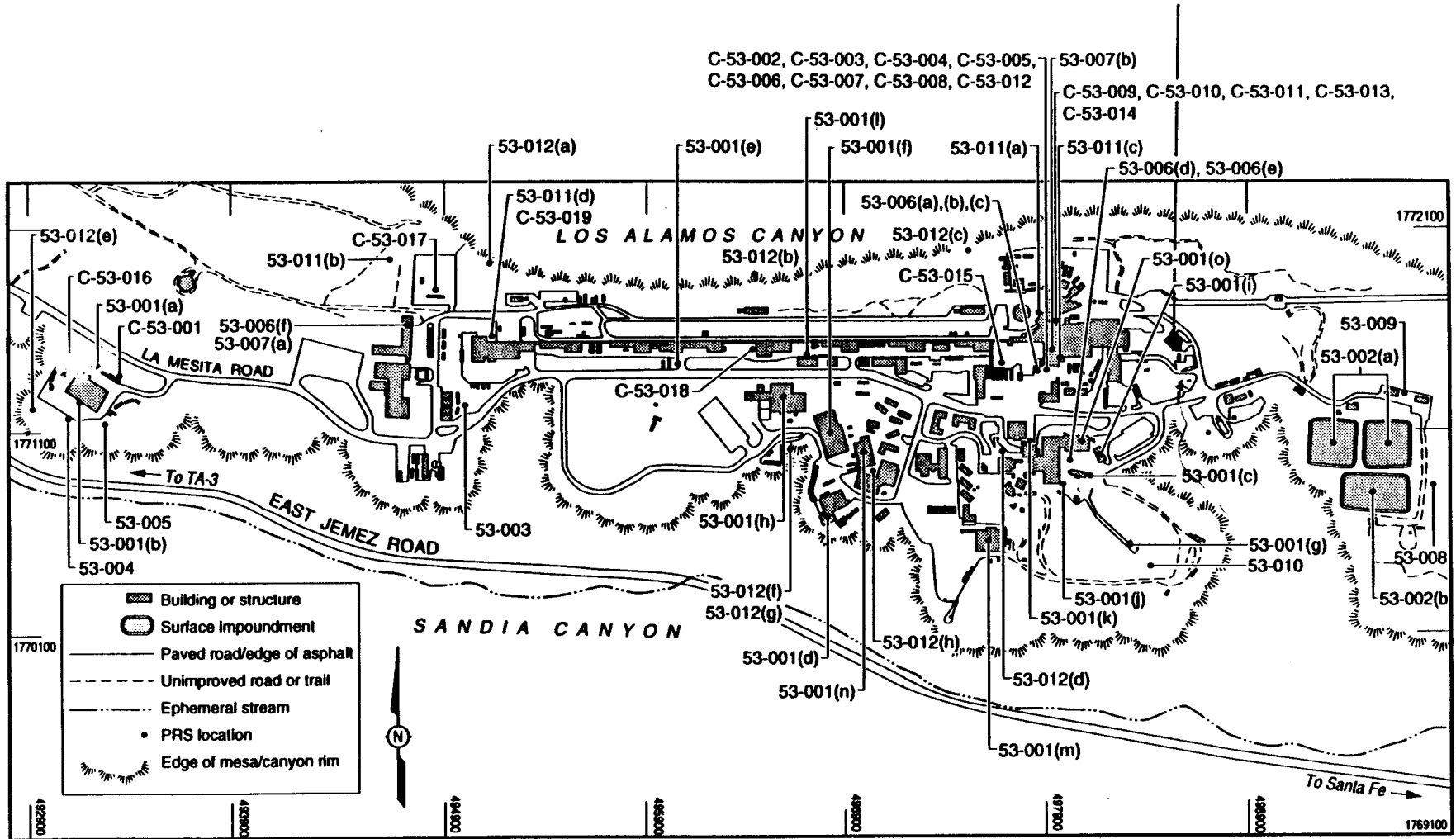


Base map sources: FIMAD 1993, G1011473  
 U.S.G.S. 1984, White Rock, N.M. 7.5' topo. quad.  
 McLin 1992, 0825  
 Modified by: cARTography by A. Kron 3/11/94

RFI Work Plan for OU 1100

Figure 3-9. Location of 100-year flood plain and PRSs in Sandia Canyon and former TA-20.

Location of TA-53-364



Source: FIMAD 1993 G101407  
 Modified by: cARTography by A. Kron 3/11/94

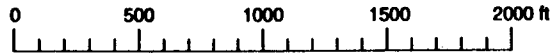


Figure 1-4. Locations of PRSs in TA-53.